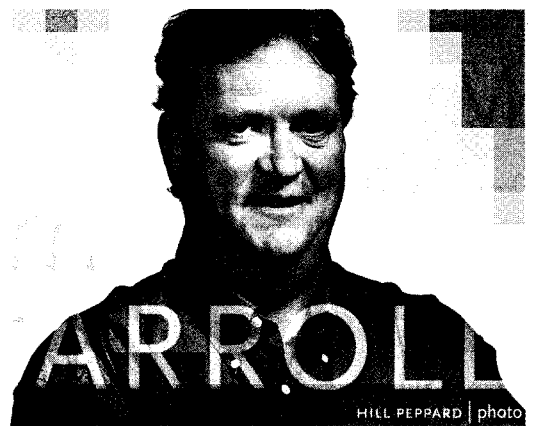


Command *and* control

Opportunity awaits companies that master hyperconnectivity



WEB WASH

IBM is Web-enabling 9,000 washers and dryers at U.S. colleges. Students can visit a website to find out when a machine will be available, and even specify what soap or fabric softener to add. When the wash is done, the "e-Suds" system sends an e-mail to the student's pager or PC. Laundromat owners will be able to monitor machine usage and performance, reducing the need for on-site service calls.

MANAGING IS A DIFFICULT balancing act – keeping one eye firmly on the present while peering carefully into the future with the other. One of the critical trends to watch is "hyper-connectivity", an Internet-enabled state in which all objects can talk to one another and humans can plug into any machine remotely. It will change the way you do business – and companies on its leading edge have the opportunity to trounce the competition.

What's going on? Millions of so-called "smart devices" are turning into the billions as dirt-cheap computer chips are integrated into all kinds of everyday household and industrial products, from microwave ovens to factory controllers. Most of the time, you won't even know you are dealing with a microprocessor, even though Intel estimates that by lunchtime, most of us have interacted with 130 or so different microchips, give or take a few dozen.

However, most of the microprocessors out there today sit silently, all by themselves, performing some type of limited function without ever linking to any other device. But the semiconductor industry is rapidly moving towards what I call the "Internet protocol chip", or IP-chip. The concept is simple: using standard Internet communications protocols, these little microprocessors can talk to other devices over the Internet and most corporate networks. Now a new generation of smart devices are key to a future in which we'll remotely monitor, manage and control almost any device we please.

Net-enabled devices are already on the market. Glass-bottle makers use the Internet Article Defects Information System from Germany's EKF Elektronik GmbH to monitor the quality of their assembly processes instantaneously over the company network or the Net. Louisiana-based Home Automation Inc. produces WebLink II, which allows you to arm and monitor your home or small-office security systems or adjust your house tem-

perature through your Web browser. And Florida-based A.P. Buck Inc. has developed remotely-enabled pumps to measure air quality, eliminating the need to individually check each sensor throughout your plant.

Up to now, applications have been limited by cost – estimates are that Web-enabling an embedded device costs up to US\$80. But computer chips are getting smarter and cheaper, and developers are working diligently to simplify the communications protocols in order to reduce the chip capacity needed to connect devices to the Net. Looking ahead, it will cost but a fraction of a penny to incorporate IP-chips into mass-production items. What's needed is business imagination to spot the long-term opportunities. For example, IP-chips could be put into a hotel alarm clock, linking the clock into the hotel network. When a power-failure hits, staff won't have to visit hundreds of hotel rooms to fix the flashing "12:00". Instead, they'll simply use a computer application to send a time-reset signal through the hotel network. Credit- and debit-card terminals will soon be IP-enabled, allowing retailers to complete such transactions over the Internet, instead of more expensive dedicated phone lines.

If you're installing environmental, security or process-control monitors, you should definitely be looking today for Web-enabled devices that will make your command-and-control functions more efficient. And if you're developing new industrial or consumer products, think about tomorrow. Ask yourself, "What if my product could communicate with the rest of the world?" The technology to make this happen is being designed today: you have to be ready to seize the opportunity. **P**

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